The Egyptian Heart Journal (2016) 68, 67–68

HOSTED BY

ELSEVIER

Egyptian Society of Cardiology

The Egyptian Heart Journal

www.elsevier.com/locate/ehj
www.sciencedirect.com

SHORT COMMUNICATION

New technique for withdrawing broken sheath

Süleyman Cagan Efe *, Ahmet Seyfettin Gurbuz, Emrah Acar, Ayhan Kup, Mehmet Fatih Yilmaz, Alev Kilicgedik, Taylan Akgun, Semi Ozturk, Cevat Kirma

Department of Cardiology, Kosuyolu Kartal Heart Training and Research Hospital, Istanbul, Turkey

Received 7 February 2015; accepted 24 March 2015
Available online 16 April 2015

KEYWORDS

Balloon catheter;
Retrieving broken sheath;
Withdrawing technique

Abstract A sheath that is broken inside vessel is a rare complication, and intravascular fragments from broken sheaths are retrieving transcutaneously by techniques including the loop snare catheter, basket catheter, and grasping/biopsy forceps. We reported a less common type of broken central venous sheath in location and a successful unique technique for retrieving it from subclavian vein by using noncompliant balloon from 40 year old female patient.

1. Case report

A 40 year old woman with history of hypertension, congestive heart failure and end stage endometrium cancer presented with dyspnea and cough. She was hospitalized due to decompensated congestive heart failure and pneumonia. As a consequence of earlier chemotherapy and radiotherapy treatment, subclavian 6F venous sheath at 11 cm length was placed for carrying out long-term intravenous treatment due to inconvenience of peripheral venous access. On the 6th day of treatment because of an unknown reason fluid delivery could not be performed properly, however blood aspiration from sheath was possible while wiggling the tap of sheath. The sheath seemed broken. We decided to change sheath under sterile conditions, inserted a guide wire and pulled venous sheath. Outer 2 cm part of sheath separated from the remaining part, therefore distal fragment remained stuck in subclavian vein. Without taking the guide wire back, we took the patient under fluoroscopy. We were not able to draw the sheath back with surgical forceps because it was too far away from skin. After informed consent, we decided to draw it by using a peripheral balloon catheter but it could not pass through lumen of sheath because of its crushed edge. Then we took another 6F sheath and passed it over the guide wire and placed it edge to edge with broken part (Fig. 1A). By keeping the 0.038 inch guide wire in place, we passed 0.014 in. guide wire through the lumen of broken sheath and pulled 0.038 inch guide wire back. Consequently 3.0×15 mm noncompliant balloon easily passed over 0.014 in. guide wire. We located noncompliant balloon in outer distal edge of broken sheath and inflated balloon at nominal pressure then pulled balloon under fluoroscopy, sheath was taken off easily outside the skin (Fig. 1B–D). We deflated balloon before reaching vessel wall concerning possible injury. After all we inserted a new central venous catheter over 0.014 guide wire.

2. Discussion

Catheter fracture is a rare complication with an estimated rate of % 0.1–1.[1] Techniques including loop snare catheter,

* Corresponding author at: Denizer Caddesi, Cevizli Kavşağı No. 2, Cevizli/Kartal, İstanbul, Turkey. Tel.: +90 5356952488; fax: +90 2164596321.
E-mail address: scaganefe@gmail.com (S.C. Efe).

Peer review under responsibility of Egyptian Society of Cardiology.

http://dx.doi.org/10.1016/j.ehj.2015.03.005

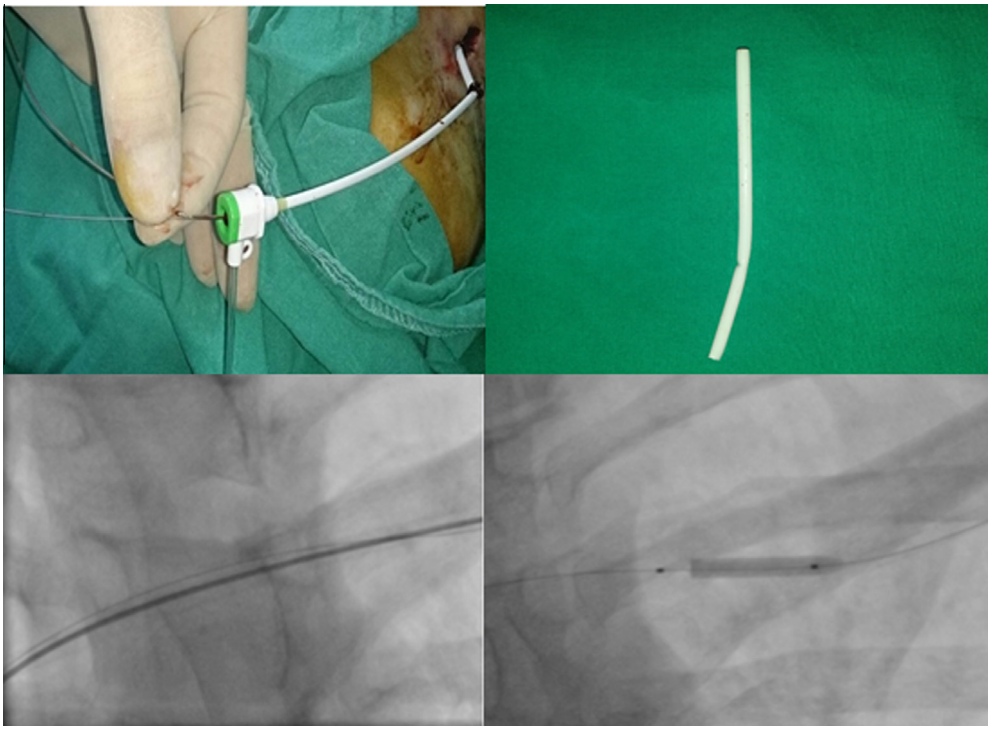

Figure 1 (A) Retrieving of broken sheath from subclavian vein, (B) broken sheath, (C) fluoroscopic view of broken sheath and (D) fluoroscopic view of balloon catheter.

basket catheter, and grasping biopsy forceps are used for percutaneous retrieval of broken sheaths and catheters.[2] First percutaneous attempt to retrieve a foreign body was reported by Rossi et al. in 1980.[3] Retrieval of broken dialysis catheter tip lodged in the pulmonary artery by using a loop snare, retrieval of a broken catheter from the left atrium in an adult patient via transseptal puncture by using helical basket guidewire and retrieval of embolized catheter fragment from the right atrium of a 6-month-old infant by using a multipurpose grasping forceps were reported in the literature.[4–6] Surgery is necessary in order to prevent complications such as infections, thrombosis and perforation, if percutaneous techniques fail.[7] However, surgery has high morbidity rates.[8] The most common location of the catheter fracture is the infraclavicular region secondary to the so-called pinch-off syndrome or thoracic inlet syndrome but catheter fracture cases depend on thoracic inlet syndrome generally seen months later catheter placement.[9] In our case there was no sign of pinch-off syndrome on chest X-ray. Our case defines that in selected cases if guide wire can pass through the broken sheath, changing guide wire with floppy guide wire and using balloon catheter is a feasible safe and unique percutaneous technique, which was not defined in the literature before.

Disclosure

The authors declare that there is no conflict of interest.

Acknowledgment

None.

References

1. Zamani H, Babazadeh K, Ghaffari R, Karami H, Fattahi S, Mokhtari Esbuie F. The successful withdrawal of a migrated central venous catheter. *Caspian J Intern Med* 2012;**3**:550–3.
2. Kim OK, Kim SH, Kim JB, Jeon WS, Jo SH, Lee JH, et al. Transluminal removal of a fractured and embolized indwelling central venous catheter in the pulmonary artery. *Korean J Intern Med* 2006;**21**:187–90.
3. Rossi P, Passariello R, Simonetti G. Intravascular iatrogenic foreign body retrieval. Experience in 13 cases. *Ann Radiol (Paris)* 1980;**23**:286–90.
4. Sagar V, Lederer E. Pulmonary embolism due to catheter fracture from a tunneled dialysis catheter. *Am J Kidney Dis* 2004;**43**:13–4.
5. Ramondo AB, Favero L, Chioin R. Percutaneous retrieval of a broken catheter from the left atrium in an adult. *J Interv Cardiol* 2002;**15**:417–9.
6. Morishita Y, Ikoma A, Yuda T, Taira A. A multipurpose grasping forceps for retrieval of an embolized catheter fragment. *J Cardiovasc Surg (Torino)* 1985;**26**:516–8.
7. Simon-Fayard EE, Kroncke RS, Solarte D, Peverini R. Nonsurgical retrieval of embolized umbilical catheters in premature infants. *J Perinatol* 1997;**17**:143–7.
8. Kadir S, Athanasoulis CA. Percutaneous retrieval of intravascular foreign bodies. In: Athanasoulis CA, Green RE, Pfister RC, Roberson GH, editors. *Interventional radiology*. Philadelphia: Saunders; 1982. p. 379–90.
9. Çilingiroğlu M, Akkuş Nl. Embolization of a PORT-A-CATH device in the main pulmonary artery and its percutaneous extraction in a patient with pinch-off syndrome. *Turk Kardiyol Dern Ars* 2012;**40**:162–4.